

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

In the Matter of	)	IB Docket No. 16-408
	)	
Update to Parts 2 and 25 Concerning Non-	)	
Geostationary, Fixed-Satellite Service Systems and	)	
Related Matters	)	
	)	
	)	

**REPLY COMMENTS OF ECHOSTAR SATELLITE  
OPERATING CORPORATION AND HUGHES NETWORK  
SYSTEMS, LLC**

**I. Introduction**

EchoStar Satellite Operating Corporation (“ESOC”) and Hughes Network Systems, LLC (“Hughes,” and together with ESOC and their affiliates, “EchoStar”) submit these reply comments in the above-captioned proceeding to update rules and facilitate deployment of non-geostationary satellite orbit (“NGSO”) fixed-satellite service (“FSS”) systems.<sup>1</sup> EchoStar is the nation’s leading provider of satellite broadband. Just last month, EchoStar brought into service the highest capacity broadband satellite in the world – the EchoStar XIX satellite (a/k/a JUPITER 2) – which is currently offering FCC-defined broadband speeds, 25 Mbps download and 3 Mbps uploads, and beyond, from coast to coast.<sup>2</sup> Using Ka-band frequencies, EchoStar is

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<sup>1</sup> See *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Notice of Proposed Rulemaking, 31 FCC Rcd 13651 (2016) (“*NGSO NPRM*”).

<sup>2</sup> Press Release, Hughes, *Hughes Announces HughesNet Gen5 High-Speed Satellite Internet Service* (released Mar. 7, 2017), <http://echostar.com/Press/Newsandmedia/Hughes%20Announces%20HughesNet%20Gen5%20High-Speed%20Satellite%20Internet%20Service.aspx>.

providing broadband service to over one million subscribers in North America and with the launch of EchoStar XIX, we anticipate significant growth in the near term..

The deployment of Ka-band NGSO FSS deployments will complement EchoStar's geostationary ("GSO") FSS network offerings and enhance the availability of Ka-band broadband services in the United States and across the globe. With existing GSO FSS satellite broadband offerings and emerging NGSO FSS constellations in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, it is time to require co-primary treatment of NGSO and GSO FSS operations in these bands. NGSO and GSO co-primary status is already standard international practice in these bands, and given the global and regional nature of these systems, co-primary treatment in the United States would cause minimal burden. Similarly, to further promote standard international practice, the Commission should permit both GSO and NGSO operations in the 19.3-19.4 GHz, 19.6-19.7 GHz and 29.3-29.5 GHz bands pursuant to the requirement that NGSO FSS systems operate on an unprotected, non-interference basis with respect to GSO FSS networks. And, going forward, to facilitate future cooperation between NGSO and GSO operators in bands in which the Commission has not established sharing rules, the Commission should adopt a default rule consistent with the No. 22.2 of the International Telecommunication Union ("ITU") Radio Regulations ("RRs") that prohibits NGSO FSS systems from causing unacceptable interference to GSO networks, or claiming interference protection from, GSO FSS and GSO BSS networks. In addition, EchoStar urges the Commission to adopt a realistic and practicable mechanism to ensure that aggregate EPFD limits are met by all NGSO systems that are providing service in the United States.

## **II. The Commission Should Grant Co-Primary Status to GSO FSS Operations in the 18.8-19.3 GHz and 28.6-29.1 GHz Bands**

The record reflects support for granting co-primary status to GSO FSS operations in the 18.8-19.3 GHz and 28.6-29.1 GHz bands.<sup>3</sup> This is an important allocation for GSO FSS and enables satellite-delivered broadband to hard-to-reach consumers, including EchoStar’s 25/3 Mbps service and its future networks. The Commission’s current allocation is founded on out-of-date rules that do not take into consideration the conclusions of both the ITU and the Commission that sharing between NGSO FSS and GSO FSS is possible in these bands.<sup>4</sup>

In their comments, Inmarsat and ViaSat support a co-primary allocation for GSO FSS in the 18.8-19.3 GHz and 28.6-29.1 GHz bands.<sup>5</sup> Inmarsat notes that these bands are allocated to NGSO and GSO operations on a co-primary basis internationally, subject to the coordination and notification procedures in Article 9 and 11 of the ITU RRs.<sup>6</sup> ViaSat observes that “GSO and NGSO systems already routinely coordinate co-primary operations at 18.3-19.3 GHz and 28.6-29.1 GHz internationally,” and the same coordination could be successfully completed in the United States.<sup>7</sup>

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<sup>3</sup> Comments of EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC, IB Docket No. 16-408, at 3-7 (filed Feb. 27, 2017) (“EchoStar Comments”). Comments of Inmarsat Inc., IB Docket No. 16-408 (filed Feb. 27, 2017) (“Inmarsat Comments”) and Comments of ViaSat, Inc. IB Docket No. 16-408 (filed Feb. 27, 2017) (“Viasat Comments”).

<sup>4</sup> EchoStar Comments at 4-5, *citing Amendment of Parts 2 and 25 of the Commission’s Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, First Report and Order and Notice of Proposed Rulemaking, 16 FCC Rcd 4096, ¶ 72 (2000).

<sup>5</sup> Inmarsat Comments at 4-5 and ViaSat Comments at 8-9.

<sup>6</sup> Inmarsat Comments at 4.

<sup>7</sup> ViaSat Comments at 9.

Only the United States and a small handful of other countries do not allocate the bands 18.8-19.3 GHz and 28.6-29.1 GHz on a co-primary basis to FSS GSO and NSGO systems.<sup>8</sup> Adding a co-primary allocation for GSO FSS operations in these bands would harmonize FCC rules and ITU Radio Regulations. As Inmarsat notes, “[d]isparate Commission rules and ITU RRs are problematic for systems and services that are international by nature ... because they create two separate sets of regulatory obligations with which operators must comply.”<sup>9</sup>

Although some NSGO FSS operators and applicants oppose the co-primary GSO FSS allocation,<sup>10</sup> these very operators are required to coordinate with GSO FSS operators in these same bands in virtually every other administration in the world, pursuant to the ITU rules.<sup>11</sup> To accomplish this, the satellites for these new NSGO FSS constellations must be designed to share these bands on a co-primary basis with GSO FSS. The reality is that any global NSGO FSS constellation must account for GSO FSS operations on a co-primary basis, and the current FCC policy is an unnecessary, and complicating, outlier.<sup>12</sup> A co-primary GSO FSS allocation will provide for international harmonization and regulatory certainty for GSO FSS and NSGO FSS

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<sup>8</sup> EchoStar Comments at 5.

<sup>9</sup> Inmarsat Comments at 4.

<sup>10</sup> Comments of Space Norway AS, IB Docket No. 16-408, at 4 (filed Feb. 27, 2017) (“Space Norway AS Comments”); Comments of The Boeing Company, IB Docket No. 16-408, at 5 (filed Feb. 27, 2017) (“Boeing Comments”); Comments of SES S.A. and O3b Limited, IB Docket No. 16-408, at 12 (filed Feb. 27, 2017) (“SES and O3b Comments”); Comments of Space Exploration Technologies Corp. at 5-6, IB Docket No. 16-408 (filed Feb. 27, 2017); Comments of WorldVu at 16, IB Docket No. 16-408 (filed Feb. 27, 2017) (“OneWeb Comments”).

<sup>11</sup> EchoStar Comments at 6; ViaSat Comments at 8-9; Inmarsat Comments at 4-5.

<sup>12</sup> See Footnote 5.532A of the International Table of Frequency Allocations which provides that, with the exception of certain grandfathered GSO networks, the spectrum may be used by both NSGO and GSO FSS systems, subject to the coordination rules of Article 9 of the ITU RRs. 47 C.F.R. § 2.106, n.5.532A.

operations for interference protection purposes, without imposing any undue burden on NGSO FSS operations.

**III. The Commission Should Adopt its Proposal to Permit GSO and NGSO Operations in the 19.3-19.4 GHz, 19.6-19.7 GHz and 29.3-29.5 GHz Frequency Bands Subject to Restrictions and Reject Boeing’s Proposal to Give NGSO FSS Priority Over GSO FSS Systems**

EchoStar, along with several other commenters, supports the *NGSO NPRM* proposal to permit GSO and NGSO FSS systems to operate in the 19.3-19.4 GHz, 19.6-19.7 GHz, and 29.3-29.5 GHz frequency bands with NGSO FSS systems operating on an unprotected, non-interference basis with respect to GSO FSS networks.<sup>13</sup> The 19.3-19.7 GHz and 29.1-29.5 GHz frequency bands are allocated to FSS operations on a co-primary basis with Fixed Services, with Iridium operating its feeder links in the 19.4-19.6 GHz downlink band and the 29.1-29.3 GHz uplink band.<sup>14</sup> In the U.S., GSO FSS operators can successfully coordinate with Iridium’s feeder link operations.<sup>15</sup> By adopting the *NGSO NPRM* proposal, the Commission would come closer to aligning its rules with the ITU and facilitating spectrum sharing in these frequency bands.

EchoStar opposes Boeing’s counterproposal to give NGSO FSS operations priority over GSO FSS in the 19.3-19.4 GHz and 19.6-19.7 GHz downlink frequency bands and the 29.3-29.5

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<sup>13</sup> *NGSO NPRM*, 31 FCC Rcd at 13657 ¶ 13. *See also* ViaSat Comments at 9; Comments Intelsat License at 3, IB Docket No. 16-408 (filed Feb. 27, 2017) (“Intelsat Comments”); SES and O3b Comments at 14; Comments of Lockheed Martin Corp. at 2, IB Docket No. 16-408 (filed Feb. 27, 2017); Inmarsat Comments at 7 (Inmarsat opposes the addition of NGSO FSS in the 29.3-29.5 GHz band).

<sup>14</sup> 47 C.F.R. § 2.106, NG166. FSS operations in the 19.3-19.7 GHz downlink are currently limited to the use of feeder links in the mobile-satellite service (“MSS”) while GSO FSS operations and MSS feeder links are permitted on a co-primary basis in the 29.1-29.5 GHz band. *See also* Intelsat Comments at 3.

<sup>15</sup> Intelsat Comments at 2.

GHz uplink frequency band.<sup>16</sup> The 29.3-29.5 GHz uplink is currently allocated to GSO FSS operators on a primary basis. In fact, EchoStar's aforementioned EchoStar XIX satellite operates in the 29.25-29.5 GHz uplink.<sup>17</sup> NGSO operators have not demonstrated a need for additional spectrum to be allocated to them on a primary basis, an approach which, as discussed above, fails to take into account the international radio regulations which these satellite networks must operate. Rather, there are systems in place to allow NGSO operators to operate on an uncoordinated, non-interference basis in this spectrum. The ITU coordination process is available as is the ITU first-come, first-serve process to enable NGSOs to operate and not disrupt current GSO operations. Boeing's proposal would complicate the regulatory landscape for GSO FSS networks and NGSO FSS operators by requiring them to comply with different frequency allocations depending on the licensing administration when there is no established need to reallocate the spectrum. The Commission should adopt its proposal to authorize the use of these bands that are currently not used by Iridium feeder links and require that NGSO FSS operations be on an unprotected, non-interference basis with GSO FSS networks.

#### **IV. The Commission Should Adopt a Default Sharing Rule for Frequency Bands**

The Commission proposes to delete the first sentence of Section 25.156(d)(5) of its rules and requests comment on whether it should adopt a provision similar to No. 22.2 of the ITU RRs.<sup>18</sup> EchoStar agrees with several commenters who propose that the Commission delete

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<sup>16</sup> Boeing Comments at 6-7.

<sup>17</sup> Hughes Network Systems, IBFS File No. SAT-LOA-20160624-00061 (granted Sept. 15, 2016). All of the satellites authorized to Hughes and EchoStar are authorized to operate in the 29.25-29.5 GHz frequency band.

<sup>18</sup> *NGSO NPRM*, 31 FCC Rcd at 13659-60 ¶ 21. 47 C.F.R. §25.156(d)(5).

Section 25.156(d)(5) in its entirety and either adopt the language of No. 22.2 of the ITU RRs or a similar provision.<sup>19</sup>

As Inmarsat notes in its comments, No. 22.2 “has been in place for many years and is the internationally accepted framework that applies between GSO and NGSO systems until other regulatory/technical frameworks are adopted” in a specific band.<sup>20</sup> EchoStar supports the adoption of a rule which would require NGSO FSS operators to neither cause unacceptable interference to, nor claim interference from, GSO FSS and GSO BSS networks in situations where the Commission has not adopted sharing criteria between NGSO-like and GSO-like satellite operations. Only Boeing opposes giving GSO networks priority in frequency bands in which the Commission has not yet established services rules.<sup>21</sup> OneWeb states that it “is confident current satellite technology and well-established inter-operator coordination mechanisms will enable appropriate spectrum sharing among NGSO and GSO constellations.”<sup>22</sup> Incorporating a rule similar to No. 22.2 in the United States would codify the spectrum sharing that has already successfully occurred between NGSO and GSO systems in the Ka-band.<sup>23</sup>

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<sup>19</sup> Comments of the Satellite Industry Association at 8-9, IB Docket No. 16-408 (filed Feb. 27, 2017) (“SIA Comments”); Inmarsat Comments at 9-10; SES and O3b Comments at 17; OneWeb Comments at 24-25. Space Norway AS supports deleting the first sentence and the adoption of a default sharing rule similar to RR No. 22.2 along with a rule establishing that a showing of compliance with the international EPFD limits will qualify as fulfilling sharing requirements. Space Norway AS Comments at 9.

<sup>20</sup> Inmarsat Comments at 10.

<sup>21</sup> Boeing Comments at 10.

<sup>22</sup> OneWeb Comments at 25.

<sup>23</sup> SIA Comments at 9.

## **V. The Commission Should Codify Existing ITU EPFD Limits**

EchoStar concurs with Inmarsat and ViaSat's support of the Commission's proposal to codify the ITU Radio Regulation (RR) Article 22 NGSO EPFD limits in the 17.8-18.6 GHz, 19.7-20.2 GHz, 27.5-28.35 GHz and 29.5-30.0 GHz bands into its rules. However, EchoStar echoes Inmarsat and Viasat's concern that the absence of a mechanism to ensure that all NGSO FSS systems licensed in a particular band will be required to comply with the aggregate EPFD limits will result in a substantial risk of interference to GSO systems. There is a high likelihood that compliance by individual NGSO systems with single entry EPFD limits will be insufficient to protect GSO FSS operations, given that the calculations from which the single-entry EPFD limits were derived hypothesized far fewer NGSO systems than are expected to be commercially viable in the near future. Accordingly, EchoStar urges the Commission to adopt a realistic and practicable mechanism to ensure that aggregate EPFD limits are met by all NGSO systems that are providing service in the United States.

## **VI. Conclusion**

EchoStar urges the Commission to establish co-primary status for GSO FSS operations in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, consistent with existing international allocations and coordination requirements. The Commission should also adopt its *NGSO NPRM* proposal to authorize GSO FSS networks to operate in the 19.3-19.4 GHz, 19.6-19.7 GHz and 29.3-29.5 GHz with NGSO FSS systems required to operate on a non-interference basis with respect to GSO FSS networks. In order to facilitate operations in bands that do not currently have sharing rules for GSO networks and NGSO systems, the Commission should require that NGSO not cause unacceptable interference to, or claim protection from, GSO FSS networks and GSO BSS networks. Finally, EchoStar urges the Commission to adopt a realistic and practicable

mechanism to ensure that aggregate EPFD limits are met by all NGSO systems that are providing service in the United States.

Respectfully submitted,

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